

Name: _____

★ KEY ★Geometry Midterm Exam REVIEW

1. Describe each relationship, and then draw a picture to illustrate the relationship.

Straight Angle Pair	Vertical Angles	Corresponding Angles
Alternate Interior Angles	Same-Side Interior Angles	Complementary Angles
Similar Figures	Congruent Figures	Hypotenuse
Supplementary angles	Slope	Triangle Inequality
Parallel Lines	Area Area Triangle = _____ Area Trapezoid = _____ Area Parallelogram = _____ Area Rectangle = _____	Perimeter

2. Solve for x.

a. $5 - (x + 7) + 4x = 7(x - 1)$

$$5 - x - 7 + 4x = 7x - 7$$

$$-2 + 3x = 7x - 7$$

$$5 = 4x$$

$$\frac{5}{4} = x$$

$$\boxed{1.25 = x}$$

b.

$$\frac{5x+9}{2} = \underline{12}$$

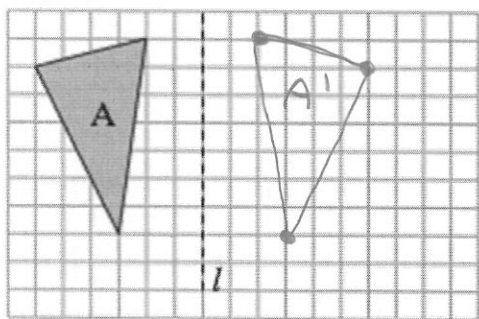
$$5x + 9 = 24$$

$$\frac{5x}{5} = \frac{15}{5}$$

$$\boxed{x = 3}$$

3. Perform the transformation

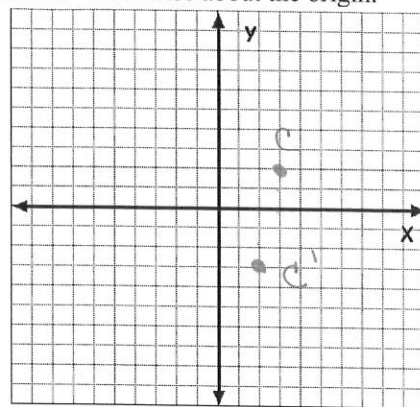
a. Reflect Figure A across line l .



b. The point $C(3, 2)$ is rotated 90° clockwise about the origin.

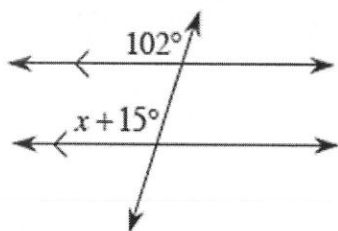
What is the coordinate of C' ?

$(2, -3)$



4. Identify the geometric angle relationship(s) in each diagram. Use what you know about those relationships to write an equation and solve for x .

a.



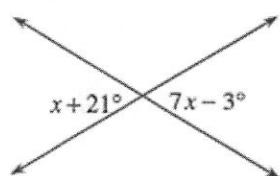
corresponding angles

$$102 = x + 15$$

$$\begin{array}{r} -15 \\ -15 \end{array}$$

$$\boxed{87 = x}$$

b.



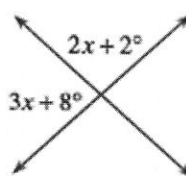
vertical angles

$$x + 21 = 7x - 3$$

$$24 = 6x$$

$$\boxed{4 = x}$$

c.



straight angle

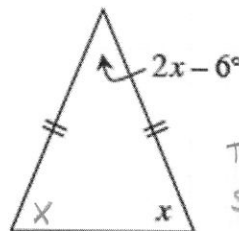
$$3x + 8 + 2x + 2 = 180$$

$$5x + 10 = 180$$

$$5x = 170$$

$$\boxed{x = 34}$$

d.



Triangle Angle Sum Theorem

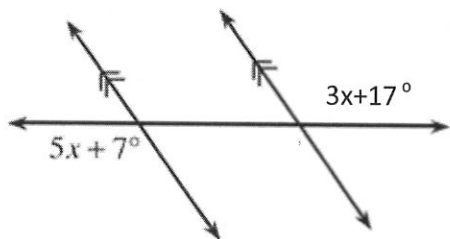
$$x + x + 2x - 6 = 180$$

$$4x - 6 = 180$$

$$4x = 186$$

$$x = 46.5$$

e.

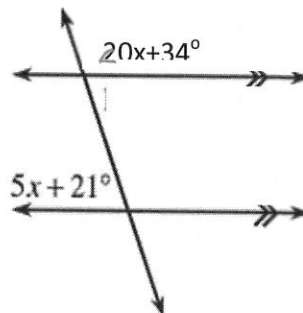


$$5x + 7 = 3x + 17$$

$$2x = 10$$

$$\boxed{x = 5}$$

f.



$$5x + 21 + 20x + 34 = 180$$

$$25x + 55 = 180$$

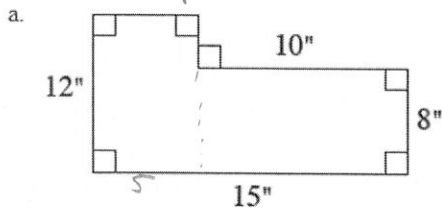
$$25x = 125 \quad \boxed{x = 5}$$

5. Find the area of each figure.

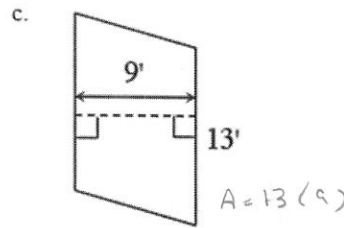
$$A = \frac{1}{2}(13)(4)$$

$$A = 117 \text{ ft}^2$$

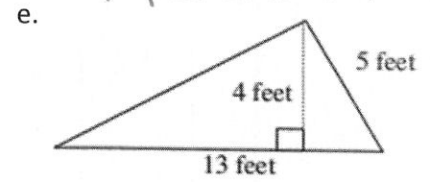
$$A = 26 \text{ ft}^2$$



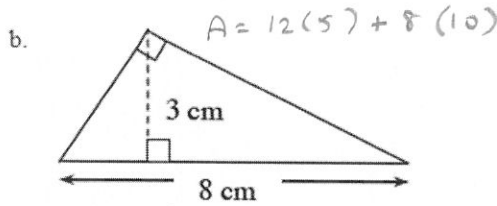
$$A = 140 \text{ in}^2$$



$$A = 13(9)$$



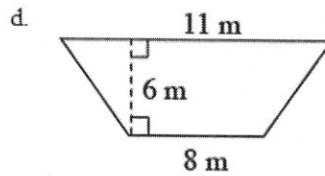
$$A = \frac{1}{2}(4)(13)$$



$$A = 12(5) + 8(10)$$

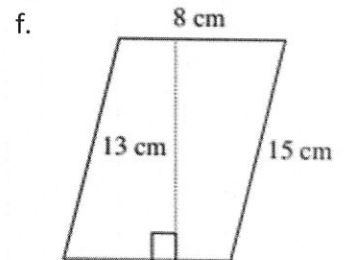
$$A = \frac{1}{2}(3)(8)$$

$$A = 12 \text{ cm}^2$$



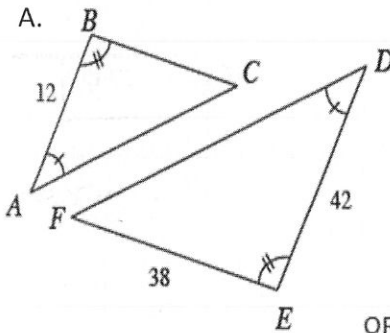
$$A = \frac{1}{2}(6)(11+8)$$

$$A = 57 \text{ m}^2$$



$$A = 104 \text{ cm}^2$$

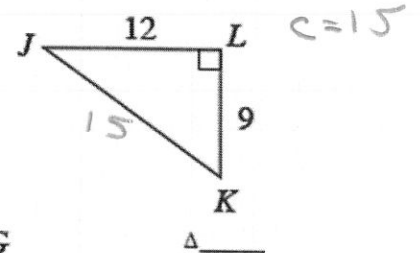
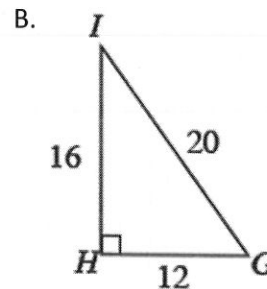
6. Determine whether the triangles below are similar. If they are similar, (a.) write the rule that states why they are similar and then (b.) write the names of the two similar triangles. If they are not similar, (a.) write "NOT ~" and then (b.) write a brief reason why not.



a. Reason: AA~

b. $\triangle ABC \sim \triangle DEF$

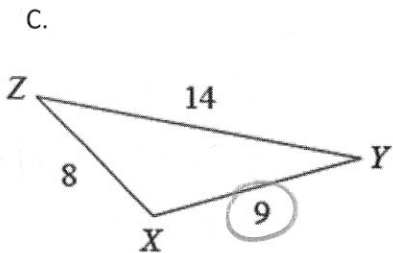
OR reason they aren't similar...



a. Reason: SAS~ or SSS~

b. $\triangle IGH \sim \triangle JKL$

OR reason they aren't similar...

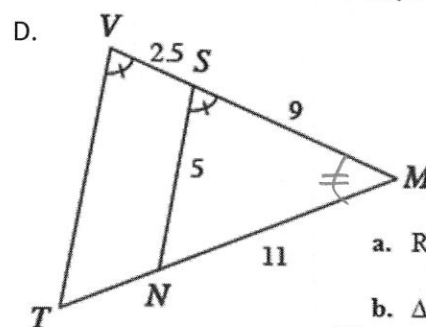


a. Reason: _____

b. $\triangle \sim \triangle$

OR reason they aren't similar...

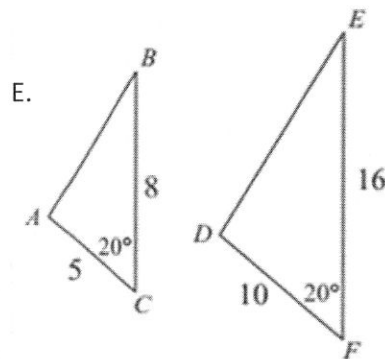
Proportions not =
 $\frac{8}{4} = \frac{14}{7} \neq \frac{9}{5}$



a. Reason: AA~

b. $\triangle MNT \sim \triangle MTS$

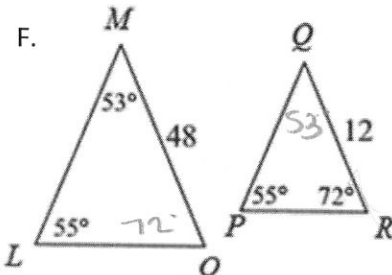
OR reason they aren't similar...



a. Reason: SAS~

b. $\triangle ABC \sim \triangle DEF$

OR reason they aren't similar...

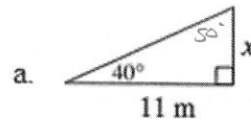
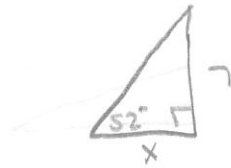


a. Reason: AA~

b. $\triangle MNO \sim \triangle PQR$

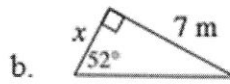
OR reason they aren't similar...

7. Solve for the missing side length or angle below.



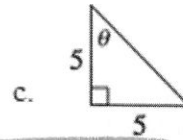
$$\tan 40 = \frac{x}{11}$$

$$x = 9.23 \text{ m}$$



$$\tan 52 = \frac{7}{x}$$

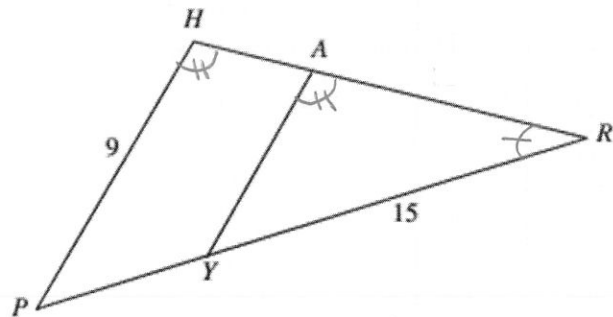
$$x = 5.47 \text{ m}$$



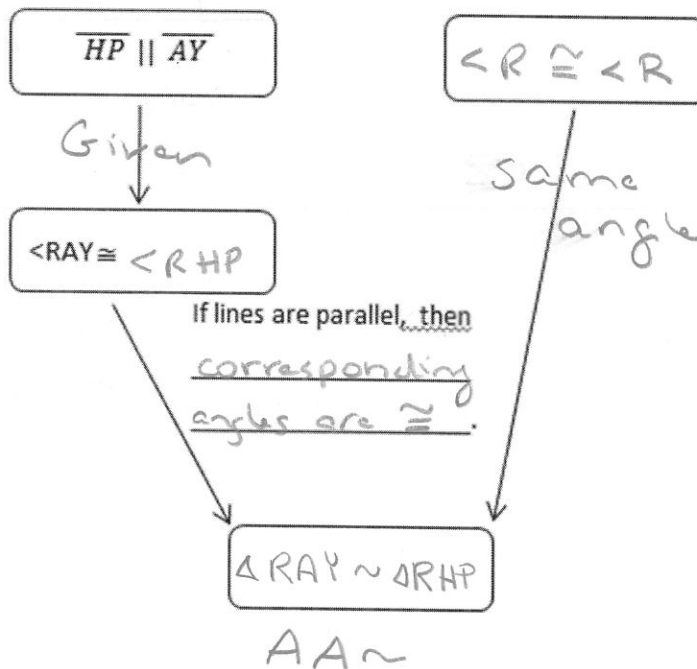
$$\theta = 45^\circ$$

ratio 1/1
so angle is 45°

8. In the figure at right, $\overline{AY} \parallel \overline{HP}$. Decide whether or not there are any similar triangles in the figure. Justify your answer with a flow chart. Can you find the length of \overline{AY} ? If so, find it. Justify your answer.



Flow chart:



9. Write the equation of the line:

- a. Perpendicular to the line $y = -\frac{3}{2}x + 3$ and passing through $(2, -1)$.

$$m = -\frac{3}{2}$$

$$m_{\perp} = \frac{2}{3}$$

$$y + 1 = \frac{2}{3}(x - 2)$$

$$y + 1 = \frac{2}{3}x - \frac{4}{3}$$

$$y = \frac{2}{3}x - 2\frac{1}{3}$$

- b. Parallel to the line $y = 2x - 2$ and passing through $(-3, 5)$

$$m = 2$$

$$m_{\parallel} = 2$$

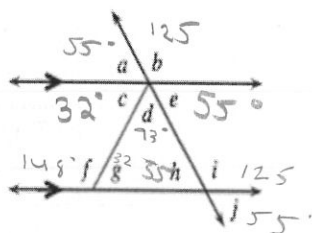
$$y - 5 = 2(x + 3)$$

$$y - 5 = 2x + 6$$

$$y = 2x + 11$$

10.

CL 4-125 Use the diagram below to answer the questions below.



- a. State the name of the geometric relationship between the angles below. Also describe the relationship between the angle measures, if one exist

i. $\angle a$ and $\angle h$ corresponding angles

ii. $\angle b$ and $\angle e$ straight angle pair

iii. $\angle c$ and $\angle g$ Alt. interior angles

iv. $\angle g$, $\angle d$, and $\angle h$ Triangle angle sum theorem

- b. Find the measure of each angle listed below and justify your answer. Let $m\angle c = 32^\circ$ and $m\angle e = 55^\circ$ in the figure above.

i. $m\angle j = 55^\circ$

ii. $m\angle d = 93^\circ$

iii. $m\angle a = 55^\circ$

iv. $m\angle g = 32^\circ$

★ Triangle Inequality ★

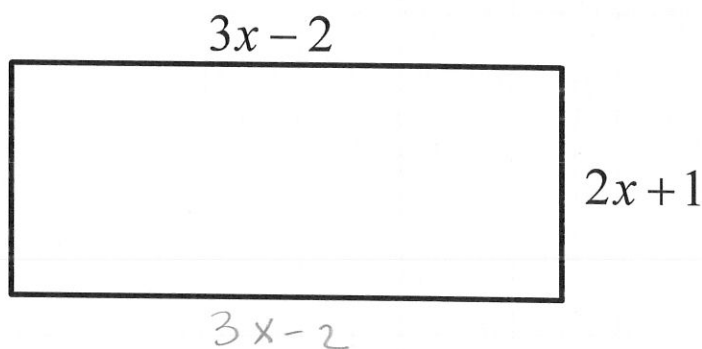
11. Determine whether the given sides could form a triangle. State Yes or NO.

- (1) 3 cm, 5 cm, and 10 cm ^{$3+5$} NO! $8 \neq 10$
 (2) 4 cm, 9 cm, and 12 cm YES! $13 > 12$ $5 < 12$ ✓
 (3) 2 cm, 4 cm, and 5 cm YES! $6 > 5$ $2 > 5$
 (4) 3 cm, 5 cm, and 8 cm NO! $8 \neq 8$

12. Given the rectangle at right, find the area and perimeter:

a. Area = $6x^2 - x - 2$ units²

b. Perimeter = $10x - 2$ units

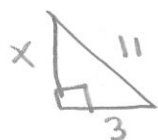


$A = (3x-2)(2x+1)$ foil
 $6x^2 + 3x - 4x - 2$

$P = 3x-2 + 2x+1 + 3x-2 + 2x+1$
 $P = 10x - 2$

13. A right triangle has a hypotenuse of 11 and one leg with length 3.

a. Draw a picture:



b. Find the length of the other leg (leave solution in radical form)

$x^2 + 3^2 = 11^2$
 $x^2 + 9 = 121$

$x^2 = 112$
 $x = \sqrt{112}$

14. Find the area and perimeter of the composite shape at right.

$P = 17 + 13 + 12 + 12$

a. perimeter = 54 cm

b. area = 174 cm²

$A = \frac{1}{2}(5)(12) + 12(12)$
 $A = 30 + 144 = 174$ cm²

